

Methods to Remove Coke from Endothermic Heat Exchangers, Phase II

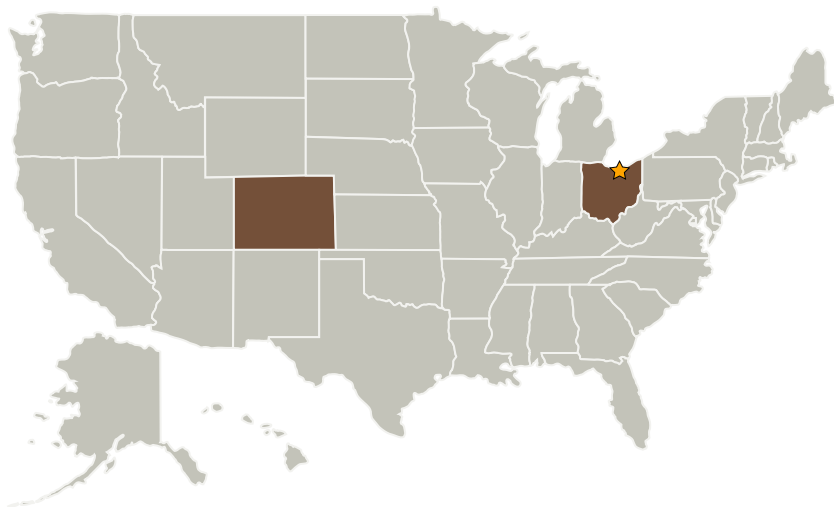
Completed Technology Project (2004 - 2006)



Project Introduction

In February 2004 NASA released "The Vision for Space Exploration", which describes a strategy for exploring our solar system that builds upon the policy announced by President Bush earlier in the year. The goals of this strategy include extending human presence in the solar system culminating in the exploration of Mars. To accomplish this goal, affordable, new propulsion technologies must be developed. A key component to this goal will be the development of reusable launch vehicles that use single stage to orbit (SSTO) or two stage to orbit (TSTO) propulsion systems. These vehicles generate high heat loads and require additional cooling capacity from the fuel, which can get very hot in the process. Unfortunately when hydrocarbon fuels are heated, carbonaceous deposits (coke) can form in the heat exchanger, reducing heat transfer and potentially inhibiting fuel flow. If vehicles are reused, then coke accumulation eventually will become a serious problem. However, if the coke could be removed periodically between missions, then the dangers associated with coke accumulation could be avoided. In this Phase I project, TDA developed a process to remove these deposits. The process is safe, inexpensive, and is conducted at low temperature and at ambient pressure.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
TDA Research, Inc.	Supporting Organization	Industry	Wheat Ridge, Colorado

Primary U.S. Work Locations	
Colorado	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.1 Cryogenic Systems
 - └ TX14.1.1 In-space Propellant Storage & Utilization